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The Effects of Numbered Heads Together-Assurance Relevance Interest Assessment Satisfaction on Students' Motivation

Muh Khalifah Mustami
Dr., Biology Department, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Alauddin Makassar, Indonesia, *muhkhalifahmustami@uin-alauddin.ac.id*

Dian Safitri
Corresponding author, Biology Department, Faculty of Teacher Training and Educational Sciences, Universitas Muhammadiyah Makassar, Indonesia, *dyansafitri87@gmail.com*

The purpose of this study was to investigate the effects of the Assurance Relevance Interest Assessment Satisfaction (ARIAS) strategies set with Numbered Heads Together (NHT) on students' learning motivation. This quasi experimental study employed a pretest-post test nonequivalent control group design. The population of the research was all the eleventh graders who were enrolled in the science classes of public senior high schools (SMA) in Makassar, Indonesia. There were 21 schools in total. Random sampling technique was used to select 78 participants who were divided into two groups of treatment: 39 students for each treatment. Research instruments were developed based on the Attention, Relevance, Confident, Satisfaction (ARCS) model. Data on students' learning motivation was collected using a questionnaire that was distributed before and after learning. Research data was analyzed using a descriptive statistic and the analysis of covariate (ANCOVA) statistic. The results of the research suggest that learning strategies have an effect on students' motivation. Compared to ARIAS direct learning model, NHT-ARIAS is more potential to improve students' motivation.

Keywords: motivation, ARCS, ARIAS, NHT, learning model, assessment, students

INTRODUCTION

Biology learning in senior high school (SMA) emphasizes on promoting students' process skills. Therefore, it requires students to get actively engaged in learning. An appropriate learning strategy or learning model could help students improve their motivation in understanding materials and as a result increase their achievement. An important reason why students need to improve their motivation is that because motivation brings a significant impact on learning (Rusillo & Arias, 2004). It is believed that learning could be more meaningful if students are more motivated (Holt, 2010).

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Learning motivation plays a major role in determining students' learning outcomes and achievement. Motivation is a process of predicting intensity, direction, and efforts to achieve the goals. According to Tosi, Mero dan Rizzo (2000), motivation has a psychological significance which refers to an individual's internal mental state related to initiation, guidance, persistence, and behavior. Besides, motivation also contains a managerial implications which is associated with an individual's managerial activity to encourage someone to pursue particular objectives. Students' learning motivation can be stimulated by a learning model (Chiang & Lee, 2016).

Cooperative learning model has been developed and confirmed as one learning model that can improve students' performance. Cooperative learning is designed to facilitate students' cooperation and dependence on each other in completing a task or purpose. Cooperative learning is aimed to provide students with knowledge, concepts, skills, and understanding (Slavin, 2009). Sadker and Sadker (2005) add that cooperative learning is very helpful in developing students' attitude and cognitive skills.

Numbered Heads Together (NHT) cooperative learning model can be applied to boost learning activity (Richard & Renandya, 2002). NHT covers four simple stages which can be repeated with various materials in different subjects (Yeh, 2004). NHT helps create a conducive and lively student-centered learning. Students are more encouraged to understand the materials because all the group members are responsible for the task. Slow students will be more enthusiastic to ask others who are better at comprehending the materials so that their potentials can be maximally developed and their achievement can be improved as a result.

Purnomo (2012) has found that NHT successfully improved students' ability and was effective in accommodating students' learning participation. NHT is designed to involve more students in discussing materials and understanding them (Arends, 2012). NHT as a learning model basically constitutes a variation of group discussion. Besides, NHT offers an opportunity for students to share ideas and consider the best answer to their learning problems. NHT also facilitates students to prepare themselves in group presentation so that all students including slow students are trying their best. In a conventional learning, competition among students is inevitable because both high and low ability students attempt to obtain maximal results (Leasa & Corebima, 2017).

NHT can be applied in a particular setting to improve students' motivation: one of which is to combine it with Assurance, Relevance, Interest, Assessment and Satisfaction (ARIAS) strategy (Khoiriyah & Rusimamto, 2016). ARIAS is quite relevant with the recent learning constructivistic learning theory. It includes some specific guidance to encourage students to learn. It also helps boost students' confidence. Students are more able to connect relevant materials to their life, evaluate themselves, and grow a sense of pride of their achievement. Sopah (2000) mentions five components of ARIAS as follows: assurance, relevance, interest, assessment, and satisfaction. The implementation of ARIAS has been proven to be able to improve students' learning achievement (Jamiah, 2009; Zulfarisna, 2009; Tilawa & Pramukantoro, 2013). In relation to the significance of NHT-ARIAS mentioned above; therefore, this study aimed to investigate the effects of the implementation of NHT-ARIAS to improve the quality of learning and students' motivation.

Theoretical Background

Motivation

Motivation serves to explain behavioral desire, behavioral intensity, behavioral direction, and the real achievement (Pintrich, 2003). According to Brophy (2004), learning motivation puts forwards cognitive responses which are more likely responded by students to perform a meaningful and beneficial academic activity. Learning motivation ensures the emergence of learning activity, and gives guidance to reach the goals (Winkel, 2004).

Santrock (2007) states that extrinsic motivation appears because someone wants to get something from others. Meanwhile, intrinsic motivation contains 1) self determination and personal choices, and 2) optimal experience. Learners' attention can be drawn by a presentation using a medium, such as through demonstration, small group discussion, classroom debate, or text variation, diagrams or images. Students' satisfaction can also be improved by giving verbal encouragement, reward, personal attention, feedback, and avoiding negative reinforcement (Keller & Suzuki, 2004).

Keller (1983) describes motivation through four main components, such as presented in ARCS. Keller and Keller (1989) have created a motivational delivery checklist which consists of 47 ARCS items to evaluate motivational characteristics. Based on that, Small (1997) developed an Instructional Material Motivation Survey (IMMS) consisting of 36 items to assess the quality of learning situated motivation.

Assurance Relevance Interest Assessment Satisfaction

ARIAS learning strategy is a modification of Attention Relevance Confidence Satisfaction (ARCS) model developed by Keller as the answer to the problem of how to improve students' motivation and achievement (Sopah, 2000). According to Ahmadi (2011), ARIAS allows the use of various learning models, methods, or media in the classroom. Meanwhile ARCS strategy consists of four major steps: attention, relevance, confidence, and satisfaction (Keller, 1990).

The first component of ARIAS learning strategy is assurance. Assurance encourages students to form a behavior to achieve a goal. Relevance is associated with what the students get at school. It must be relevant with what the students find in their every day life, such as the ones related to their past, present, or future experiences and career (Sopah, 2000). Keller (1990) says that students' motivation will be improved if what they are studying is correlated with what they face in life. Therefore, it clarifies their purpose and gives a concrete hope which in turns encourages them to achieve their goals. Satisfaction of the results provides reinforcement for the students to be more active in pursuing their purposes (Sopah, 2000).

Numbered Heads Together

Numbered Heads Together (NHT) is one of learning models that can be used to accommodate students' active participation in learning process. NHT can be interpreted as teacher's effort to involve students in the process of learning (Haydon et.al., 2010). Learning activity conducted with NHT can positively affect students' achievement

(Hunter, et.al., 2016). This participation is realized in three stages of learning: planning, implementation, and evaluation.

According to Kagan (2007), NHT emphasized on group work instead of individual work. Students are required to work together and provided a chance to distribute information and improve their communication skills. NHT is an alternative learning model that can be used to solve the educational problem. NHT promotes cooperative work among students. Students are divided into some small groups and guided to do the tasks. The purpose of putting the students into groups is to provide an opportunity for the students to get actively involved in the thinking and learning process (Nursyamsi & Corebima, 2016).

Research Objectives

The objective of this research was to investigate the difference in students' motivation: between those who were taught with NHT-ARIAS and those who studied in direct ARIAS setting. The hypothesis of this research was there was a difference in students' motivation between those who were taught with NHT-ARIAS and those who studied in direct ARIAS setting.

METHOD

Research Design

This research was designed as a quasi experimental research which employed a pretest-posttest nonequivalent control group design (Borg & Gall, 1983). The independent variables of this research were NHT-ARIAS learning strategy and ARIAS direct learning strategy. Meanwhile the dependent variable of this research was students' motivation. Research design is presented in Table 1.

Table 1
Quasi Experimental Research Design

Pretest	Group	Posttest
T_1	X_1	T_2
T_3	X_2	T_4

where:
T_1 and T_3: Pretest
T_2 and T_4 : Posttest
X_1: direct ARIAS learning strategy
X_2: NHT-ARIAS learning strategy

Research Sample

The population of the research was all the eleventh graders who were enrolled in the science classes of public senior high schools (SMA) in Makassar, Indonesia. There were 21 schools in total. Random sampling technique was used to select 78 participants who were divided into two groups of treatment: 39 students for each treatment.

Instruments

Students' motivation was measured using a questionnaire which consisted of 36 statements. The questionnaire was developed according to the Attention, Relevance, Confident, Satisfaction (ARCS) model suggested by Keller (1983). Scales employed in

the questionnaire were Likert Scales which contained items: strongly agree, agree, disagree, and strongly disagree. Instrument used in this study had been validated empirically and theoretically by the experts. Aspects evaluated were construction, materials, language, and distribution of time of the instrument. The validation results indicated that the students' motivation questionnaire was very valid with the score x = 4.9 for all aspects measured. The empirical validity was measured by distributing the questionnaire to 40 senior high school students in Makassar, Indonesia. The reliability of the instrument was shown by the score or index indicating errors that might occur. It was found that the reliability of the instrument was; 0.69.

Research Procedures

Each class was taught with different learning strategies: NHT-ARIAS and NHT direct setting for one semester. The NHT-ARIAS classroom made use of learning tools developed by the researchers. These learning tools consisted of syllabus, lesson plans, and students' worksheets (LKS). Learning occurred in 16 weeks on digestive system, respiration system, excretion system, regulation system, reproduction system, and immune system.

Data Collection and Data Analysis

Data on students' motivation was collected by a motivational questionnaire which was distributed before and after learning. The data was then analyzed using a descriptive statistic and the analysis of covariate (ANCOVA) from SPSS 20.0 for Windows. Prior to the ANCOVA analysis, a normality test and a homogeneity test were conducted. The normality test was performed using One-sample Kolmogorov-Smirnov while the homogeneity test was performed using the Levene's Test of Equality of Error Variances.

FINDINGS

Data on students' learning motivation before and after the implementation of direct ARIAS learning strategy is recorded in Table 2.

Table 2
Students' Motivation Before and After the Implementation of Direct ARIAS Learning Strategy

	Direct ARIAS Learning Strategy	
Statistic	Pretest	Posttest
Number of students	39	39
Average	67.49	80.41
Median	67.00	82.00
Mode	69	82
Standard Deviation	5.52	6.42
Variance	30.41	41.30
Range	24	31
The lowest score	54	67
The highest score	78	98

According to table 2, the motivation of 39 eleventh graders from the science classes of public senior high school (SMAN) 11 Makassar improved after the treatment. Students'

motivation is categorized into very high, high, medium, low, and very low, as shown by Table 3.

Table 3
Students' Motivation Frequency and Category Before and After the Implementation of Direct ARIAS Learning Strategy

		Frequency		Percentage (%)	
Interval	Criteria	Pretest	Post test	Pretest	Posttest
84-100	Very high	0	10	0	25.64
68-83	High	18	28	46.15	71.79
52-67	Medium	21	1	53.85	2.56
36-51	Low	0	0	0	0
20-35	Very low	0	0	0	0
Total		39	39	100	100

Table 3 presents the distribution of students' motivation scores which are centred on the medium, high, and very high category. This finding suggests that direct ARIAS learning strategy could improve students' motivation. Data on students' motivation frequencies and percentages is justified by data on the improvement of students' motivation scores calculated using gain normalization (Table 4).

Table 4
Students' Motivation Gain Score After the Implementation of Direct ARIAS Learning Strategy

Interval	Frequency	Percentage (%)	Category
$0 \leq$ N-g < 0.3	14	35.90	Low
$0.3 \leq$ N-g < 0.7	21	53.85	Medium
$0.7 \leq$ N-g ≤ 1.0	4	10.26	High

Table 4 shows the results of Gain normalization before and after the implementation of direct ARIAS learning strategy. Findings indicate that the majority of the students (53.85%) have improved their motivation to medium category.

The results of the research which proven that there is an increase in students' motivation scores after and before the implementation of NHT-ARIAS learning strategy can be seen in Table 5.

Table 5
Students' Motivation Before and After the Implementation of NHT-ARIAS Learning Strategy

	NHT-ARIAS Learning Strategy	
Statistic	Pretest	Posttest
Number of student	39	39
Average	64.10	89.03
Median	63.00	90.00
Mode	62	90
Standard Deviation	4.93	5.69
Variance	24.30	32.39
Range	19	25
The lowest score	58	75
The highest score	77	100

According to table 5, the students' learning motivation has improved after being given the treatment. The students' motivation scores fall into some categories: very high, high, medium, low, and very low, as shown by Table 6.

Table 6
Frequency and Category of Students' Motivation Before and After the Implementation of NHT-ARIAS Learning Strategy

		Frequency		Percentage (%)	
Interval	Criteria	Pretest	Post test	Pretest	Post test
84-100	Very high	0	33	0	84.62
68-83	High	6	6	15.38	15.38
52-67	Medium	33	0	84.62	0
36-51	Low	0	0	0	0
20-35	Very low	0	0	0	0
Total		39	39	100	100

The table above presents that the students' motivation scores are centred in category medium, high, and very high. This finding indicates that there is an improvement in students' motivation after the implementation of NHT-ARIAS learning strategy.

Data on students' motivation frequencies and percentages is justified by data on the improvement of students' motivation scores calculated using Gain normalization or Gain Score (Table 7).

Table 7
Students' Motivation Gain Score After the Implementation of NHT-ARIAS Learning Strategy

Interval	Frequency	Percentage (%)	Category
$0 \leq$ N-g < 0.3	0	0	Low
$0.3 \leq$ N-g < 0.7	12	30.77	Medium
$0.7 \leq$ N-g ≤ 1.0	27	69.23	High

Table 7 shows the results of Gain normalization before and after the implementation of NHT-ARIAS learning strategy. Findings indicate that most of the students (69.23%) experienced an improvement in motivation to high category.

The results of the normality and the homogeneity test are presented in Table 8.

Table 8
The Result of the Normality and Homogeneity Test

Learning Strategy	Normality	Homogeneity	Alpha
Direct ARIAS	0.329	0.316	0.05
NHT ARIAS	0.145	0.063	0.05

Table 8 suggest normal distribution of data and homogeneous variants (sig normality and homogeneity > 0.05).
The result of the covariance analysis on students' motivation are depicted in Table 9.

Table 9
The Result of the Covariance Analysis on Students' Motivation

Calculated Significance Value	Table Significance Value
0.000	0.05

The results of the covariance analysis presented in table 8 suggest to reject H_0 since the calculated significance value (0.000) < sig. α (0.05). This finding shows that there is a significance different found in students' motivation between the students who learned using the direct ARIAS learning strategy and those who learned using the NHT-ARIAS learning strategy. Therefore, it can be assumed that the NHT-ARIAS has more significant effect on students' learning motivation compared to the direct ARIAS learning strategy. This assumption is justified by the fact that the estimated value of classroom parameters of the direct ARIAS learning strategy (-8.344) is much lower than of the NHT-ARIAS learning strategy (0).

DISCUSSION

The results of the research indicate that the two different learning strategies bring different impacts to students' motivation. The NHT-ARIAS learning strategy is more potential in improving students' motivation compared to the direct ARIAS learning strategy. Gokhale (1995) and Grant et al., (2013) have revealed that a learning strategy which promotes collaborative activities is effective in raising students' interest and motivation to learn. This finding is supported by a theory suggested by Sopah (2000) mentioning that ARIAS strategy can improve students' motivation. Similarly, Khoiriyah & Rusimamto (2016) also came to a conclusion that ARIAS learning strategy had a positive effect on students' motivation and achievement. Also, the results of the ANCOVA analysis indicate that there is a significant difference in students' motivation between students who learned using students who learned using the direct ARIAS learning strategy and those who learned using the NHT-ARIAS learning strategy.

The five major elements in ARIAS help students develop their self confidence, improve their ability to adapt to the learning situation and condition, and raise their interest in learning. Besides, ARIAS also provides students with learning evaluation and a sense of pride in themselves (Piktoriawan, Arini & Riastini (2014). The results of the research show that students who learned using the NHT-ARIAS learning strategy are more motivated compared to those learned using the direct ARIAS learning strategy. This could happen because the direct ARIAS learning strategy does not give students a chance to be active so that they become more passive and less motivated.

In an NHT-ARIAS learning setting, teachers appreciate their students' work by giving rewards or compliments or claps to the best selected group. This is in line with Siahaan et.al., (2010) who states that reward and compliments given by the teacher make students feel more satisfied with what they have done. The students will feel proud oft themselves because they receive either verbal or nonverbal positive feedback from their environment (Ahmadi, 2011). Furthermore, Ningsih (2010) points out that ARIAS learning model has a positive effect on students' mastery of biology concepts.

The majority of the students who learned using the direct ARIAS learning strategy fall into high motivation category, while most of the students who learned using the NHT-

ARIAS learning strategy are considered to have very high motivation. It indicates that the implementation of ARIAS learning strategy has resulted in the increased motivation of the students. Similarly, Jamiah (2009a) and Praptinasari et.al., (2012) mention that the ARIAS learning strategy could boost students' confidence, interest, and motivation (Tilawa, 2013).

The integration of the NHT learning model into the ARIAS strategy created a more conducive and lively learning environment where students became more active and learning became more student-centered. The students attempted to master the materials because all the group members were given a responsibility to complete the task. Besides, the NHT cooperative learning model also provided an opportunity for the students to share their ideas or opinions with each other, and therefore they are able consider the best answer to the problem. The cooperation among the students was encouraged, so low ability students were allowed to ask a favor from the students who were better at mastering the subject. Each student was more active in seeking for a solution to the learning problem since they should be always prepared for the teacher's call to answer the question. As a result, their potentials could be developed optimally. The students' full participation definitely resulted in an increase in their learning motivation. Sopah (2001) states that ARIAS learning strategy is effective in improving students' achievement in affective, cognitive, and psychometric domain. In similar fashion, the present research have proven that the students' active participation results in their improved psychometric skills and improved motivation.

Harper and Maheady (2007) reveal that the low ability students will be benefited from group discussion promoted through NHT. Giving rewards can also have a positive influence on students' cognitive achievement (Carpenter, 2006). The NHT-ARIAS learning strategy is considered as a collaboration of a learning strategy and a learning model that is effective in improving students' motivation. This is in line with what is suggested by Ahmadi (2011), mentioning that the integration of an appropriate learning model, method, or medium into the implementation of ARIAS will result in an active, innovative, and fun learning which also satisfies the students. Moreover, Suyanik (2010) has concluded that the implementation of ARIAS learning strategy which is oriented to cooperative learning can positively affect students' motivation which is reflected by their achievement. In short, it can be said that ARIAS, supported by NHT can create an active learning condition which is student centered and has a positive implication on students' motivation.

CONCLUSION

The results of the research suggest that:

- Learning strategy has an effect on students' motivation. The average score of students' motivation after the implementation of NHT-ARIAS learning strategy is significantly different from the average score of students' motivation after the implementation of direct ARIAS learning strategy; therefore,
- The NHT-ARIAS learning strategy is more effective in improving students' motivation compared to the direct ARIAS learning strategy.

This research was limited to the implementation of NHT-ARIAS in senior high school. However, teachers in elementary schools and junior high schools can also implement this learning strategy because it has been proven that this learning strategy is effective in improving students' motivation. It is expected that future researchers can focus more on students' cognitive level and critical thinking skills.

REFERENCES

Ahmadi, L. K. (2011). *Integrated Schools Learning Strategies*. Jakarta: Prestasi Pustaka Publisher, (In Indonesia).

Arends, R. I. (2012). *Learning to Teach,* 9th. New York: McGraw-Hill Company, Inc.

Borg, W. L & Gall, M. D. (1983). *Educational research, an introduction. (4th Ed*.). Longman Inc: New York and London.

Brophy, J. (2004). *Motivating Students to Learn, Second Edition*. New Jersey London: Lawrence Erlbaun Associates Publishers Mahwah.

Carpenter, J. (2006). Effective Teaching Methods For Large Classes. *Journal of Family & Consumer Sciences Education*, 24: 13-23.

Chiang, L. C & Lee, H. (2016). The Effect of Project-Based Learning on Learning Motivation and Problem-Solving Ability of Vocational High School Students. *International Journal of Information and Education Technology*, 6/9, 709-721.

Gokhale, A. A. (1995). Collaborative Learning Enhances Critical Thinking. *Journal of Technology Education*, 7/1, 22-30.

Grant, D. M.; Malloy, A. D., & Hallowell, G. P. (2013). Enhancing Students' Interest in Science and Technology trough Cross-disciplinary Collaboration and Active Learning Techniques. *Journal of Information Technology Education: Innovations in Practic*, 12/1, 101-112.

Harper, G. F., & Maheady, L. (2007). Peer Mediated Teaching and Students with Learning Disabilities. *Intervention in School and Clini*c, 43: 101-107.

Haydon T, et al. (2010). Effects of Numbered Heads Together on The Daily Quiz Scores and on-Task Behavior of Students with Disabilities. *J. Behav. Educ.*, 19/3, 222–238.

Holt, J. (2010). *Why Students Failed*. Jakarta: Penerbit Erlangga, (In Indonesia).

Hunter C. W., et al. (2016). Consultants and Coteachers Affecting Student Outcomes with Numbered Heads Together: Keeping All Engaged. *J. Educ. Psychol. Consult*, 1–14.

Jamiah, Y. (2009). Improving the Quality of University Students' Achievement in Mathematics and Learning Process through ARIAS (Assurance, Relevance, Interest, Assessment, and Satisfaction) at PGSD FKIP UNTAN Pontianak (In Indonesia). *Jurnal Cakrawala Kependidikan,*. 6/2, 190-200.

Kagan, S. & Kagan, M. (2007). *Kagan Cooperative Learning.* San Clemente: Kagan Publishing.

Keller, J. M. (1983). Motivational design of instruction. *Intructional Design Theories and Models: An Overview of their current status*. Hillsdale, N.J: Lawrence Erlbaum.

Keller, J. M. & Keller, B. H. (1989). *Motivational Delivery Checklist*. Florida: Florida State University.

Keller, J. M. (1990). Development and Use of the ARCS of Motivational Design. *Journal of Instructional Development,* 10/3, 2-10.

Keller, J. M. & Suzuki, K. (2004). Learner Motivate on and e-learning Design: a Multinationally Validated Process. Journal of Educational Media, 29/3, 229-239.

Khoiriyah, N. & Rusimamto, P. W. (2016). The Implementation of ARIAS Learning Model to Improve the Tenth Graders' Learning Achievement in Flip-Flop Series at SMK Negeri 2 Bangkalan (In Indonesia). *Jurnal Pendidikan Teknik Elektro*. 05/01, 175-181.

Leasa, M. & Corebima, A. D. (2017). The Effect of Numbered Heads Together (NHT) Cooperative Learning Model on The Cognitive Achievement of Students with Different Academic Ability, *Journal of Physics,* 795: 1-9.

Ningsih, K. (2010). The Effectiveness of Contextual Teaching and Learning Based ARIAS Learning Model Improving Junior High School Students' Achievement in Science Basic Competences in Pontianak (In Indonesia). *Jurnal Cakrawala Kependidikan,* 2: 112-123.

Nursyamsi & Corebima, A. D. (2016). The Effect Of Numbered Heads Together (NHT) Learning Strategy On The Retention Of Senior High School Students In Muara Badak, East Kalimantan, Indonesia. *European Journal of Education Studies*, 2/5, 47-58.

Piktoriawan, E. P.; Arini, W. N. & Riastini, N. P. (2014). The Implementation of ARIAS Learning Model in Improve the Sixth Graders' Learning Achievement in Natural Science at Elementary School No 3 Patas Gerokgak District Academic Year 2013/2014 (In Indonesia). *Jurnal Mimbar PGSD Universitas Pendidikan Ganesha Jurusan PGSD,* 2/1, 1-11.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. Journal of Educational Psychology, 95 (4): 667–686.

Praptinasari, S.; Santosa, S., & Probosari, M. R. (2012). The Effect of Implementing ARIAS Learning Model on the Eleventh Graders' Biology Learning Achievement at SMA AL Islam 1 Surakarta (In Indonesia). *Jurnal Pendidikan Biologi*, 4/1, 78-88.

Purnomo, S. (2012). Improving the students'reading comprehension Through numbered heads together technique. *Journal on English as a Foreign Language,* 2/2, 37-44.

Richards, J. C. & Renandya, W. A. (2002). *Methodology in Language Teaching, an Anthology of Current Practice.* Cambridge: Cambridge University Press.

Rusillo, C. T. M. & Arias, C. F. P. (2004). Gender differences in academic motivation of secondary school students. *Electronic Journal of Research in Educational Psychology*,2/1, 97-112.

Sadker, D. M. P. & Sadker, D. M. (2005). *Teachers, Schools, and Society (7th ed.).* New York: McGraw-Hill.

Santrock, J. (2007). *Child Development.* New York. McGrow.

Siahaan, P.; Setiawan, W. & Sa'adah. (2010). The Implementation of ARIAS in Learning (In Indonesia). *Jurnal Pendidikan Teknologi dan Informasi*. 1: 23-27.

Small, R. V. (1997). Assessing the Motivational Quality of World Wide Websites. *ERIC Clearinghouse on Information and Technology.* (ED number pending, IR 018331).

Slavin, R. (2009). *Cooperative Learning: Teori, Riset, and Praktis (Terjemahan dari Cooperative Learning: Theory, Research, dan Practice.* Terjemahan oleh Yusron, Nurilita. 2010. Bandung: Nusa Media.

Sopah, D. (2000). The Effect of Learning Model and Motivation for Achievement on Students' Learning Achievement (In Indonesia). *Jurnal Pendidikan dan Kebudayaan*, 5/22, 121-137.

Sopah, D. (2001). The Development and Use of ARIAS Learning Model (In Indonesia). *Jurnal Pendidikan dan Kebudayaan*. 31: 455-469.

Suyanik. (2010). Thinking Empowerment through Questions (PBMP) with Think Pair Share (TPS) and ARIAS in Senior High School Biology Learning (In Indonesia). *Jurnal Pendidikan Biologi*, 2/1, 43-54.

Tilawa, I. S & Pramukantoro, J. A. (2013). The Effect of ARIAS Motivational Strategies on Students' Learning Achievement and Motivation in Producing an Audio Recording at SMKN 2 Surabaya (In Indonesia). *Jurnal Penelitian Pendidikan Elektro*, 01/1, 89-94.

Tosi, H. L.; Mero, N. P., & Rizzo, J. R. (2000). *Managing Organizational Behaviour*. Cambridge, Massachusetts: Blackwell.

Uno, H. B. (2011). *Theory of Motivation and its Measurement*. Jakarta: PT. Bumi Aksara, (In Indonesia).

Winkel, W. S. (2004). *Teaching Psychology*. Jakarta: PT. Grasindo, (In Indonesia).

Yeh, Y. C. (2004). Students' Perception of Cooperative Learning Methods in One Senior High School EFL Classroom in Taiwan. *Thesis.* Taipei: Ming Chuan University.

Zulfarisna. (2009). The Utilization of ARIAS Model to Improve the Eleventh Graders' Learning Activity and Achievement in Composition of Functions at SMA Negeri Padang Panjang (In Indonesia). *Jurnal Guru*, 1/6, 37-42.